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Results similar to those recorded in the table here given have been obtained in a much more extensive study of heredity in feeble-mindedness which was recently reported by Goddard.²

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THE TEXAS-CALIFORNIA ARC OF PRIMARY TRIANGULATION

A GREAT arc of primary triangulation more than 1,200 miles in length, extending from central Texas to the Pacific coast, has just been completed by the Coast and Geodetic Survey. It connects the 98th meridian primary triangulation in the vicinity of Weatherford, Texas, with the Pacific coast primary triangulation in the vicinity of San Diego, California.

It is connected with the United States and Mexican Boundary at a number of places and is joined to and correlates a number of detached government surveys. It furnishes the geographic positions on the U. S. Standard Datum, of more than two hundred points which can be used to control all future public surveys within the region traversed.

There are 92 primary stations in the main scheme of this triangulation and, in addition, 38 stations in secondary schemes which provide for the connections with United States-Mexican boundary monuments and existing triangulation. The total area covered by the triangulation is 48,400 square miles, the average length of line east of El Paso is 17 miles, and from that place to the Pacific coast it is 62 miles. The maximum length of line is about 120 miles. The observations were made with a 12-inch theodolite, the pointings being made on heliotropes and acetylene lamps mounted at the stations observed upon. During the progress of the triangulation two primary bases were measured and 24 primary azimuths were observed.

The reconnaissance for this work was made between September, 1907, and February, 1908, and the observing was done in three seasons

between November, 1908, and February, 1911. The total work was done in less than three years and six months, and the observations in less than two years and four months.

While the Coast and Geodetic Survey has, in the past, made more rapid progress on primary triangulation in the United States than that made in any other country, yet the rate of progress on the Texas-California arc exceeds that on any other arc in this country and the unit costs per square mile of area covered by the main scheme and per mile of progress are only about one half those of the triangulation between Marysville, Cal., and Tacoma, Wash., the arc for which, previously, these unit costs were the lowest. The accuracy, as measured by the closing errors of triangles of the Texas-California arc, is greater than that specified in the requirements for such work.

The remarkable rapidity of progress and the low cost of the work were largely due to the small amount of camp equipage used by each unit of the party; to the fact that only two officers had charge of field work, the writer on reconnaissance and a portion of the first season's observing, and Mr. J. S. Hill on the remainder of that season's work and that of the succeeding two seasons; and to the services of a most efficient signalman, Mr. J. S. Bilby, who was attached to each party from the beginning of the reconnaissance to the end of the observing. The parties were organized and managed, in the main, in a manner similar to that of the parties engaged on other pieces of primary triangulation done by this survey in recent years, only such changes being made as were necessary to meet new conditions which were encountered in semi-arid and arid sections, much of which was also mountainous.

This arc of primary triangulation will not necessarily be discussed separately by this survey in investigations of the figure of the earth, as were the two great arcs, one extending across the continent along the 39th parallel of latitude and the other paralleling the Atlantic coast from Maine to the Gulf, and known, respectively, as the "transcontinental arc" and

² *Amer. Breeders Magazine*, Vol. I., No. 3.

the "oblique arc." In the last two publications by the Coast and Geodetic Survey on investigations of the figure of the earth (entitled, "The Figure of the Earth and Isostasy from Measurements in the United States" and "A Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy") the method was adopted of using the entire connected network of triangulation.

WILLIAM BOWIE,

Inspector of Geodetic Work

COAST AND GEODETIC SURVEY

**THE ITHACA MEETING OF THE SOCIETY
OF AMERICAN BACTERIOLOGISTS,**

DECEMBER 28-30, 1910

Bacteriology in General Education (president's address): V. A. MOORE.

This address is printed in full in SCIENCE, February 24, 1911. (Secretary.)

A Bacteriological Museum and Bureau for the Exchange of Bacterial Cultures at the American Museum of Natural History, New York: C. E. A. WINSLOW.

The Department of Public Health at the American Museum of Natural History has equipped a laboratory to serve as a central bureau for the preservation and distribution of bacterial cultures of both pathogenic and non-pathogenic organisms, and particularly of types of new forms and varieties. It is hoped that the laboratories of medical schools, colleges, boards of health, agricultural experiment stations, etc., and those engaged in biochemical work of all sorts, will furnish the museum with cultures at present in their possession, and the laboratory is now ready to receive and care for all such cultures. It is desired to have the history of the organisms in as full detail as possible and the museum will be glad, where necessary, to pay for the expense of transferring cultures and transcribing records. Types of new species and varieties are particularly desired at the present time and as they may be isolated in the future.

The laboratory plans also to keep on file descriptions of bacterial species in print or arranged in the form of the standard card and will be grateful for copies of any such descriptions.

Descriptions filed in the department will be carefully preserved and living cultures will be kept in good condition, so far as possible, and will be supplied to corresponding laboratories and

schools and other institutions which may desire cultures. The laboratory, of course, can not undertake to keep on hand difficultly-cultivable organisms, such as can only be maintained for a few weeks after isolation from the body; neither can it at present supply virulent cultures of organisms which rapidly lose their virulence under laboratory conditions. It should, however, be able to furnish cultures of organisms of all the ordinary types, which can be maintained under cultivation. Pathogenic forms will only be sent to properly qualified persons.

It is hoped, further, that the laboratory may offer opportunities for work in systematic bacteriology, and facilities will be offered to properly trained workers who may desire to conduct such work at the museum or to obtain cultures for carrying it on elsewhere.

The Proposed Microbiological Central Station in Berlin: OTTO RAHN.

This paper consisted of a review of the efforts put forth in Germany to establish a central station for investigations and distribution of microbiological cultures. It was in line with the preceding paper, but indicates that the German policies are more extensive and complete. (Secretary.)

The Fermenting Capacity of the Average Individual Cell (Bacterium lactis acidi): OTTO RAHN.

It is possible to compute approximately the amount of metabolic products formed by one bacterial cell in one hour. This unit is called "fermenting capacity." Object of this computation is the separation of the two vital factors of microbial activity, the growth and the fermentation. At present, this separation can be accomplished only by a mathematical calculation. The fermenting capacity of the average cell is approximately given by the equation:

$$X = \frac{S \log b/a}{t(b-a) \log 2},$$

where S is the amount of products formed during the time t , a is the number of cells in the beginning, b the number after t hours. The fermenting capacity of the average cell of *Bacterium lactis acidi* is about 0.000,000,001 to 0.000,000,004 mg. of lactic acid per hour. This amount is of the same order of magnitude as the weight of the cell.

Old cultures of *Bacterium lactis acidi*, if transferred into fresh milk, ferment very slowly because the power of multiplication as well as the